PATENT ABSTRACTS OF JAPAN

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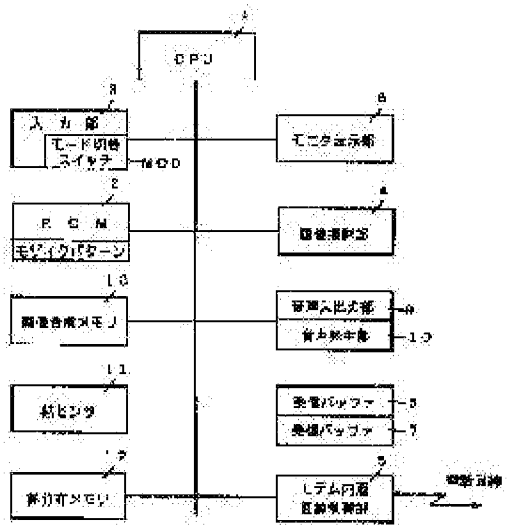
(54) IMAGE PROCESSOR WITH VIDEO TELEPHONE

(57)Abstract:

PROBLEM TO BE SOLVED: To transmit a photographed image while effectively working it such as hiding the section desired not to be watched by a party or combining any image different from real one when transmitting the photographed image through a video telephone to the opposite side.

SOLUTION: A mode changeover switch MOD is provided for switching an ordinary mode and an image working mode, etc., and a CPU 1 discriminates the switching state of this mode. When a video telephone line is connected while the image working mode is set, the CPU 1 works the photographed image by superimposing a mosaic pattern on one part of the present image photographed by an image photographing part 4. Thus, the worked image is transmitted through a line control part 5 with built-in MODEM to the opposite side.



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CLAIMS

[Claim(s)]

[Claim 1]A telephone line, an image processing device with a TV phone which transmits and receives a taken image between communications partners via a modem which are provided with the following and characterized by transmitting a taken image processed by this taken image processing means to the other party.
The normal mode which transmits a taken image transmitted to the other party as it is.
A mode switching means which changes image-processing mode which processes a taken image and transmits.
A mode discrimination means which distinguishes the mode changed by this mode switching means.
A portrait image specifying means which pinpoints an image range corresponding to a person out of a taken image transmitted to the other party when it is distinguished that this mode discrimination means changes to image-processing mode, A taken image processing means which processes at least some taken images transmitted to the other party based on an image range pinpointed by said portrait image specifying means when changing to said image-processing mode.

[Claim 2]An image processing device with a TV phone given in a claim (1), wherein said taken image processing means processes a taken image by piling up a fixed image pattern beforehand decided to be the background parts except an image range pinpointed by said portrait image specifying means among taken images.
[Claim 3]An image processing device with a TV phone given in a claim (1), wherein said portrait image specifying means pinpoints an image range corresponding to a person based on a heat ray distribution state which has a heat sensor which detects a distribution state of a heat ray, and was detected by this heat sensor.

[Claim 4]An image processing device with a TV phone given in a claim (3) with which said portrait image specifying means distinguishes the strength based on a heat ray distribution state detected by a heat sensor, and a heat ray is characterized by specifying a strong face part as a portrait image.
[Claim 5]An image processing device with a TV phone given in a claim (1), wherein said taken image processing means processes a taken image by piling up a fixed image pattern beforehand decided to be the image range pinpointed by said portrait image specifying means among taken images.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the image processing device with a TV phone which transmits and receives a taken image between communications partners via a telephone line and a modem.

[0002]

[Description of the Prior Art]In recent years, it is in the tendency for the video telephone system using a dial-up line to spread also through each home, and effective communication is enabled by transmitting and receiving a taken image between communications partners. The taken image (TV footage) from the other party is displayed on a window on a text screen, the personal computer with a TV phone which incorporated TV footage as text data is also developed, and it is in the tendency for the application range to also be expanded.

[0003]

[Problem(s) to be Solved by the Invention]However, also in which system using a TV phone or it, a self taken image is transmitted to the other party as it is as a still picture or video, and also when it was not necessarily able to be said that a communication function can be exhibited effectively, it was. That is, when the room photoed is complicated, and is in disorder or appearance is confused, usually he does not want a partner to see the state, but in the former, it will be correctly transmitted to the other party to the state. the technical problem of this invention is it processing a taken image effectively hiding the portion's his does not want to be seen by the partner's, when transmitting a taken image's to the other party with a TV phone, or the actual condition's combining a different picture's etc., and enabling it to transmit.

[0004]

[Means for Solving the Problem]The means of this invention is as follows. In an image processing device with a TV phone which transmits and receives a taken image between

communications partners via a telephone line and a modem, (1) and a mode switching means are input devices which change the normal mode which transmits a taken image transmitted to the other party as it is, and image-processing mode which processes a taken image and transmits.
(2) and a mode discrimination means distinguish the mode changed by this mode switching means.
(3) and a portrait image specifying means pinpoint an image range corresponding to a person out of a taken image transmitted to the other party, when it is distinguished that this mode discrimination means changes to image-processing mode.
When (4) and a taken image processing means are changed to said image-processing mode, a taken image which processes at least some taken images transmitted to the other party based on an image range pinpointed by said portrait image specifying means, and was processed by this is transmitted to the other party.
It may be made for said taken image processing means to process a taken image by piling up a fixed image pattern beforehand decided to be the background parts except an image range pinpointed by said portrait image specifying means among taken images. Here, a mosaic pattern for a fixed image pattern to obscure clearness of background parts or a actual background is a background pattern etc. of imagination which has arranged a different background pattern, i.e., upgraded furniture etc., tidily. Said portrait image specifying means has a heat sensor which detects a distribution state of a heat ray, and it may be made to pinpoint an image range corresponding to a person based on a heat ray distribution state detected by this heat sensor. In this case, said portrait image specifying means distinguishes that strength based on a heat ray distribution state detected by a heat sensor, and it may be made for a heat ray to specify a strong face part as a portrait image. It may be made for said taken image processing means to process a taken image by piling up a fixed image pattern beforehand decided to be the image range pinpointed by said portrait image specifying means among taken images. If a mode discrimination means will distinguish a mode state set now if a circuit of a TV phone is connected, and it distinguishes being set to image-processing mode now at the time of dispatch or arrival of a TV phone, A portrait image specifying means pinpoints an image range corresponding to a person out of a taken image transmitted to a partner. Then, a taken image processing means processes at least some taken images transmitted to the other party based on an image range pinpointed by said portrait image specifying means, when changing to said image-processing mode. A taken image processed by this is transmitted to the other party. therefore, when transmitting a taken image to the other party with a TV phone, hiding a portion he does not want to be seen by partner, or combining a different picture from the actual condition etc. can process a taken image effectively, and can transmit.

[0005]

[Embodiment of the Invention]Hereafter, one embodiment of this invention is described with reference to drawing 1 - drawing 6. CPU1 is a central processing unit which controls operation by this whole image processing device with a TV phone according to the various programs stored in ROM2. When ROM2 transmits a self taken image (self-portrait) besides various programs, such as an I/O control program, to the other party, the mosaic pattern for hiding a part of this self-portrait (it obscures) is stored. This mosaic pattern is 1 character size, and is used for a shading off of background parts etc. by embedding this pattern one by one at the background parts of a self-portrait, etc.

[0006]Mode changeover switch MOD besides various kinds of keys usually equipped with the input part 3 is provided. The normal mode which transmits a self-portrait as it is when this mode changeover switch MOD transmits a taken image (self-portrait) to the other party, They are the image-processing mode (only a face background shading-off mode, the mode, tamper-proof mode) which processes a self-portrait and transmits, a rotary switch, a sliding type switch which change only the voice which stops transmission of a self-portrait and transmits only a sound to the mode, etc. Here, background shading-off mode is the mode for directing the image-processing processing which obscures background parts by embedding a mosaic pattern at the background parts of a self-portrait. It is the mode only for a face to direct the image-processing processing to which the mode embeds a mosaic pattern into all the portions except a face among self-portraits, and the portion concerned is obscured. Tamper-proof mode is the mode for directing the image-processing processing which embeds a mosaic pattern into a person portion as measures over a prank call, and obscures persons, such as a face, and it is the mode for directing the voice processing treatment which processes a sound.

[0007]The picture photographing part 4 constitutes a video camera, and A solid state image pickup device. It has (for example, CCD series), and photoelectric conversion is carried out, and a white balance and color adjustment are performed, and the object image received by this solid state image pickup device is changed into a digital signal from an analog signal, and is incorporated into CPU1. When CPU1 distinguishes here the present mode set by mode changeover switch MOD and it is set to image-processing mode as a result, Image-processing processing according to it is performed, it becomes irregular by the line control part 5 with a built-in modem, and the self-portrait processed by this is transmitted to the other party.

[0008]The line control part 5 with a built-in modem carries out the strange recovery of voice data and the image data, and performs transmission and reception of voice data and image data between the other party via the receive buffer 6 and the dispatch buffer 7. Here, it restores to the voice data and the image data which have been transmitted from the other party by the line control part 5 with a built-in modem, the display output of the partner picture is carried out to the monitor display section 8 as it is, and voice response of the voice data is carried out from the loudspeaker which constitutes the voice input/output part 9.

[0009]The voice input/output part 9 is the composition of having a microphone and a loudspeaker, and when mode changeover switch MOD is set to tamper-proof mode, CPU1 processes the voice inputting from a microphone and it transmits it to the other party. Here, it processes whether processing of voice inputting cuts an addresser's low-pitched sound, or an addresser's sound is recognized and a machine sound is made to pronounce from the sound generation part 10, and selection of the processing sound is performed by operating the specific key on the input part 3.

[0010]The heat sensor 11 is a noncontact type temperature sensor, and the infrared rays according to the skin temperature of the human body are detected, the heat distribution state according to the intensity is changed into a digital signal, and is incorporated into CPU1, and it is stored in the heat distribution memory 12. In this case, there is a temperature gradient in the portion of a face, and the portion which wears clothes, and since the wavelength of the infrared rays emitted becomes brief so that temperature is high, it becomes possible to identify the portion of a face, and the portion which wears clothes according to that heat distribution state. Here, when it processes a self-portrait, CPU1 performs discernment from a person and background parts, and discernment of those other than [its] a face based on the contents of the heat distribution memory 12, by this, pinpoints the machining range of a self-portrait and embeds a mosaic pattern in the machining range concerned. In that case, CPU1 compounds a self-portrait and a mosaic pattern using the picture synthesis memory 13, and it transmits this image composing to the other party.

[0011]Drawing 2 is what showed roughly the appearance of the image processing device with a TV phone, and the heat sensor 11 is formed for the input part 3 in the picture photographing part 4 which constitutes a video camera to the monitor display section 8 up side, and its neighborhood again at the upper part. That is, near the picture photographing part 4 which photos an addresser's transverse plane, the heat sensor 11 is formed and the heat sensor 11 is installed in the position which can detect the heat distribution state of a photographic subject equivalent to a taken image (self-portrait) from the transverse plane.

[0012]Next, operation of this image processing device with a TV phone is explained according to the flow chart shown in drawing 3 and drawing 4. When the circuit of a TV phone is connected now that is, at the time of dispatch or arrival, the sound and taken image which have been transmitted from the other party are incorporated via the line control part 5 with a built-in modem, and, as for voice response/generating picture, are carried out as it is. On the other hand, the taken image and sound of the self which transmits to the other party become a thing according to the present mode (only voice the normal mode, image-processing mode, mode) set up by mode changeover switch MOD. Therefore, before sending after changing to the desired mode by mode changeover switch MOD at the time of dispatch, and carrying out on hook at the time of mail arrival, it changes to the desired mode. Of course, it may change during a telephone call at the normal mode, and the change in the mode can be performed if needed.

[0013]Drawing 3 is the flow chart which showed voice transmission processing. First, CPU1 distinguishes the change state of mode changeover switch MOD (Step A1), and if it is not in tamper-proof mode, Although the voice inputting from a microphone is transmitted to the other party as it is via the line control part 5 with a built-in modem like usual (Step A2), when set to tamper-proof mode, the selective state of the voice set up beforehand is distinguished (step A3). As a transmission sound here Male voice, the female voice, especially low voice, high voice, young voice, If it has become selectable arbitrarily by the key operation on the input part 3 about false sounds, such as astringent voice, it distinguishes whether which these false sounds are chosen and neither is chosen, the low compass of a dial tone is cut, and this processing sound is transmitted to the other party (Step 4). On the other hand, when it is chosen any of a false sound they are, speech recognition of the voice inputting is carried out (step B5), the sound corresponding to the false sound selected based on the voice message identification code obtained by this speech recognition is generated from the sound generation part 10, and this sound is transmitted to the other party (Step A6). Thus, when set to tamper-proof mode, the processing sound which processed voice inputting will be transmitted to the other party.

[0014]Drawing 4 is the flow chart which showed picture transmitting processing. First, when CPU1 distinguishes the change state of mode changeover switch MOD (Step B1) and only voice is set to the mode, it escapes from this flow, but when set to the other modes, image-processing mode or the normal mode is checked (step B-2). Now, if set to the normal mode, the taken image (self-portrait) obtained by the picture photographing part 4 will be set to the picture synthesis memory 13 as it is, and (Step B3) the contents of this picture synthesis memory 13 are transmitted to the other party via the line control part 5 with a built-in modem (Step B9).

[0015]On the other hand, when set to image-processing mode, start the heat sensor 11 and the heat distribution state of a photographic subject is detected, and (step B4) this heat distribution state is analyzed, and it changes into the contour pattern according to that strength, and sets to the heat distribution memory 12 (step B5). A person's face outline and the contour pattern of the body will be obtained by this, and it will be set to the heat distribution memory 12. And the kind in image-processing mode is distinguished (step B6-B8). Since (Step B6) and the background parts except the contour pattern of a human body are specified here when set to background shading-off mode, A taken image is compared with the contents of the heat distribution memory 12, background parts excluding a human body from the inside of a taken image are specified, a mosaic pattern is embedded one by one at these background parts, and it sets to the picture synthesis memory 13 (Step B10). That is, deployment arrangement of the taken image for one screen is carried out into the picture synthesis memory 13 as it is, and the mosaic pattern (vertical x width is a check pattern of a predetermined dot, etc.) of 1 character size is embedded one by one at the background parts specified by referring to the heat distribution memory 12, and it dies. Although drawing 5 (A) is a figure showing the situation in this case, and a mosaic pattern is embedded one by one and arranged from the upper left of the taken image for one screen, about the mosaic pattern which laps with a human body portion, a polymerization portion is cut along with the outline of a human body in that case. Therefore, background parts were obscured by the mosaic pattern although the human body image turned into a clear picture along the border line. Thus, the contents of the picture synthesis memory 13 by which image processing was carried out are transmitted to the other party (Step B9). Drawing 6 (A) shows the taken image transmitted to the other party in this background shading-off mode.

[0016]When only the face is set to the mode (Step B7), by referring to the heat distribution memory 12, CPU1 specifies the portion of a face out of a taken image, embeds a mosaic pattern at other all except a face, and sets it to the picture synthesis memory 13 (Step B11). Namely, since the contour pattern according to the strength of a heat distribution state is set to the heat distribution memory 12, there is a temperature gradient in the portion of a face, and the portion which wears clothes, and the wavelength of the heat ray emitted becomes brief so that temperature is high, Based on the contour pattern according to it, CPU1 specifies outline Pan of a face and, other than this (background parts, portion which wears clothes), it embeds a mosaic pattern. Thus, drawing 6 (B) which transmits the contents of the picture synthesis memory 13 by which image processing was carried out to the other party (Step B9) shows the picture by which only a face is transmitted to the other party in the mode.

[0017]When set to tamper-proof mode (switch B8), CPU1 specifies the human body portion of a taken image by referring to the heat distribution memory 12, Performing [namely,] image-processing processing which obscures a human body portion (Step B12) the person in a taken image is specified based on the contour pattern of the human body portion set to the heat distribution memory 12, and CPU1 embeds a mosaic pattern one by one to the inside of this person, and it dies. Drawing 6 (B) is what showed this situation, and when it embeds a mosaic pattern on a person, it arranges a mosaic pattern to oversized rather than a person. That is, when determining whether embed a mosaic pattern from the upper left of a taken image and lapping with a person like a graphic display at a part of mosaic pattern, a mosaic pattern will be embedded rather than a person by embedding the position and determining as an object oversized. Thus, drawing 6 (C) by which the contents of the picture synthesis memory 13 by which image processing was carried out are transmitted to the other party (Step B9) shows the picture transmitted to the other party in tamper-proof mode.

[0018]Since according to the image processing device with a TV phone constituted as mentioned above a taken image can be processed and it can transmit according to the present mode changed by mode changeover switch MOD, a portion not to be looked at by the other party can be hidden by a mosaic pattern. Since processing of a picture can also choose the kind with the switching position in the mode, it becomes possible to choose a portion not to be seen by the partner. Since the heat sensor 11 is used and the heat distribution state of the photographic subject was detected when a person was specified out of a taken image, it becomes possible to discriminate background parts and a person's face part from a person easily. In tamper-proof mode, since a sound is also processible besides a picture, it becomes possible to demonstrate the preventive effect effectively.

[0019]Two kinds of mosaic patterns may be prepared so that the shading-off grades of a person and a background may differ. Not only a mosaic pattern but as a fixed image pattern for processing a taken image, it is arbitrary. That is, although the background etc. were obscured by the mosaic pattern, it may be made to hide a portion not to show as the other party thoroughly by embedding a coloring pattern and an encaustic pattern. If scenery patterns which have arranged a different background pattern from a actual background, for example, upgraded furniture etc., tidily, such as a background pattern of imagination, the sea, a mountain, are embedded, sense of incongruity will not be given to the other party, but it will become more effective. Two or more sorts of fixed image patterns for processing a taken image are prepared, and it may enable it to choose the pattern for which it asks out of it. It may be made to process the person itself. For example, it may be colored clothes or may be made to transpose to other clothes. In this case, if it is video, according to a motion of the body, what is necessary is just made to perform image processing. When the person's camera station is decided, it may be made have made it specify by analyzing the heat distribution state detected by the heat sensor 11, when a person was specified, but to specify a person by making the person pattern memorize beforehand.

[0020]

[Effect of the Invention]since according to this invention hiding the portion he does not want to be seen by the partner, or combining a different picture from the actual condition etc. can process a taken image effectively and it can transmit when transmitting a taken image to the other party with a TV phone, it becomes a thing adapted to the actual condition.

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TECHNICAL FIELD

[Field of the Invention]This invention relates to the image processing device with a TV phone which transmits and receives a taken image between communications partners via a telephone line and a modem.

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PRIOR ART

[Description of the Prior Art]In recent years, it is in the tendency for the video telephone system using a dial-up line to spread also through each home, and effective communication is enabled by transmitting and receiving a taken image between communications partners. The taken image (TV footage) from the other party is displayed on a window on a text screen, the personal computer with a TV phone which incorporated TV footage as text data is also developed, and it is in the tendency for the application range to also be expanded.

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EFFECT OF THE INVENTION

[Effect of the Invention]in this invention, when transmitting a taken image to the other party with a TV phone, hiding the portion he does not want to be seen by the partner, or combining a different picture from the actual condition etc. can process a taken image effectively, and can transmit.
Therefore, it becomes a thing adapted to the actual condition.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]However, also in which system using a TV phone or it, a self taken image is transmitted to the other party as it is as a still picture or video, and also when it was not necessarily able to be said that a communication function can be exhibited effectively, it was. That is, when the room photoed is complicated, and is in disorder or appearance is confused, usually he does not want a partner to see the state, but in the former, it will be correctly transmitted to the other party to the state. the technical problem of this invention is it processing a taken image effectively hiding the portion's his does not want to be seen by the partner's, when transmitting a taken image's to the other party with a TV phone, or the actual condition's combining a different picture's etc., and enabling it to transmit.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]The block lineblock diagram of an image processing device with a TV phone.
[Drawing 2]The figure showing roughly the appearance of an image processing device with a TV phone.
[Drawing 3]The flow chart which showed voice transmission processing.
[Drawing 4]The flow chart which showed picture transmitting processing.
[Drawing 5]It is the figure in which it was what showed the situation at the time of embedding a mosaic pattern to the taken image, and (A) showed the embedding to background parts, and (B) showed the embedding to the person portion.
[Drawing 6]It is the figure in which the transmitted picture according to the mode was shown, (A) showed background shading-off mode, (B) showed the mode, and, as for (C), only the face showed the transmitted picture in tamper-proof mode.
[Description of Notations]
1 CPU
2 ROM
3 Input part
4 Picture photographing part
5 A line control part with a built-in modem
6 Receive buffer
7 Dispatch buffer
8 Monitor display section
9 Voice input/output part
11 Heat sensor
12 Heat distribution memory
13 Picture synthesis memory

MOD mode changeover switch

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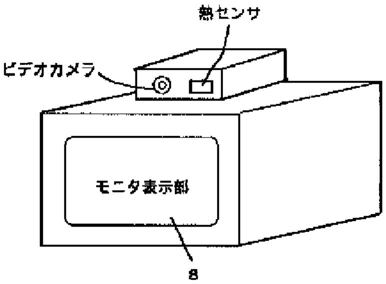
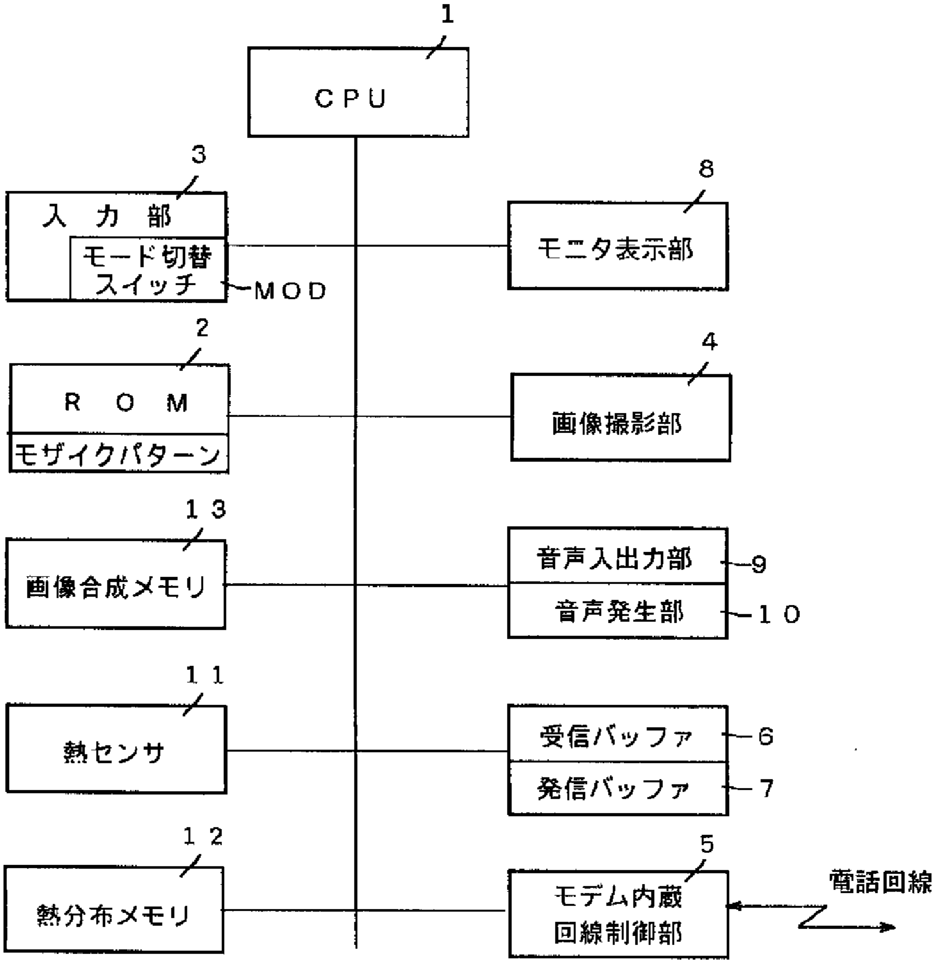
DRAWINGS

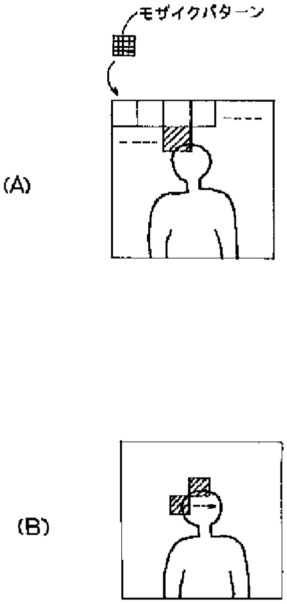
[Drawing 2]



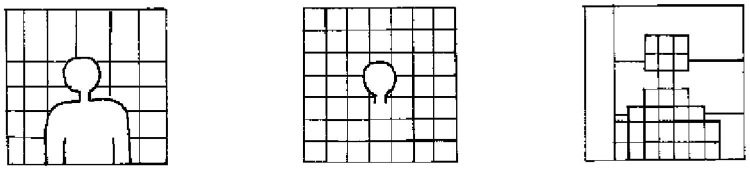
[Drawing 1]


1
CPU
3
入力部
モード切替スイッチ
MOD
8
モニタ表示部
2
ROM
モザイクパターン
4
画像撮影部
13
画像合成メモリ
音声入出力部
9
音声発生部
10
11
熱センサ
受信バッファ
6
発信バッファ
7
12
熱分布メモリ
5
モデム内蔵回線制御部
電話回線

[Drawing 5]


モザイクパターン
(A)
(B)

[Drawing 6]

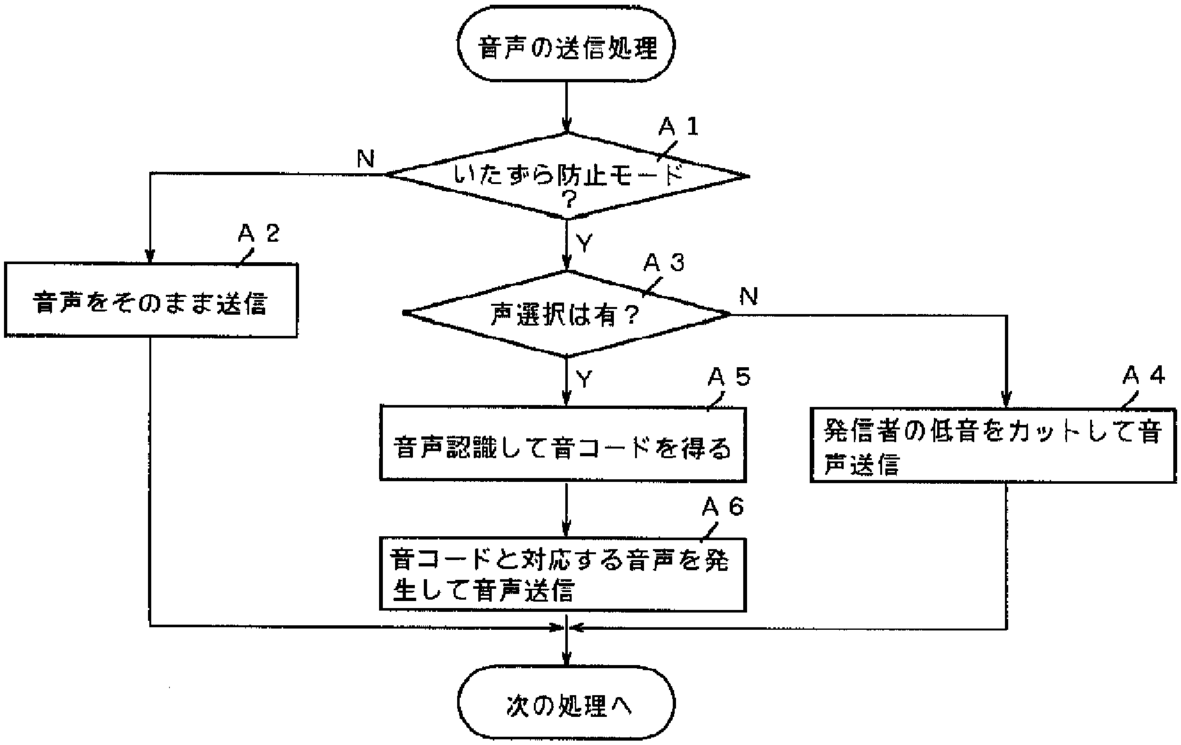


背景ぼかしモード (A)

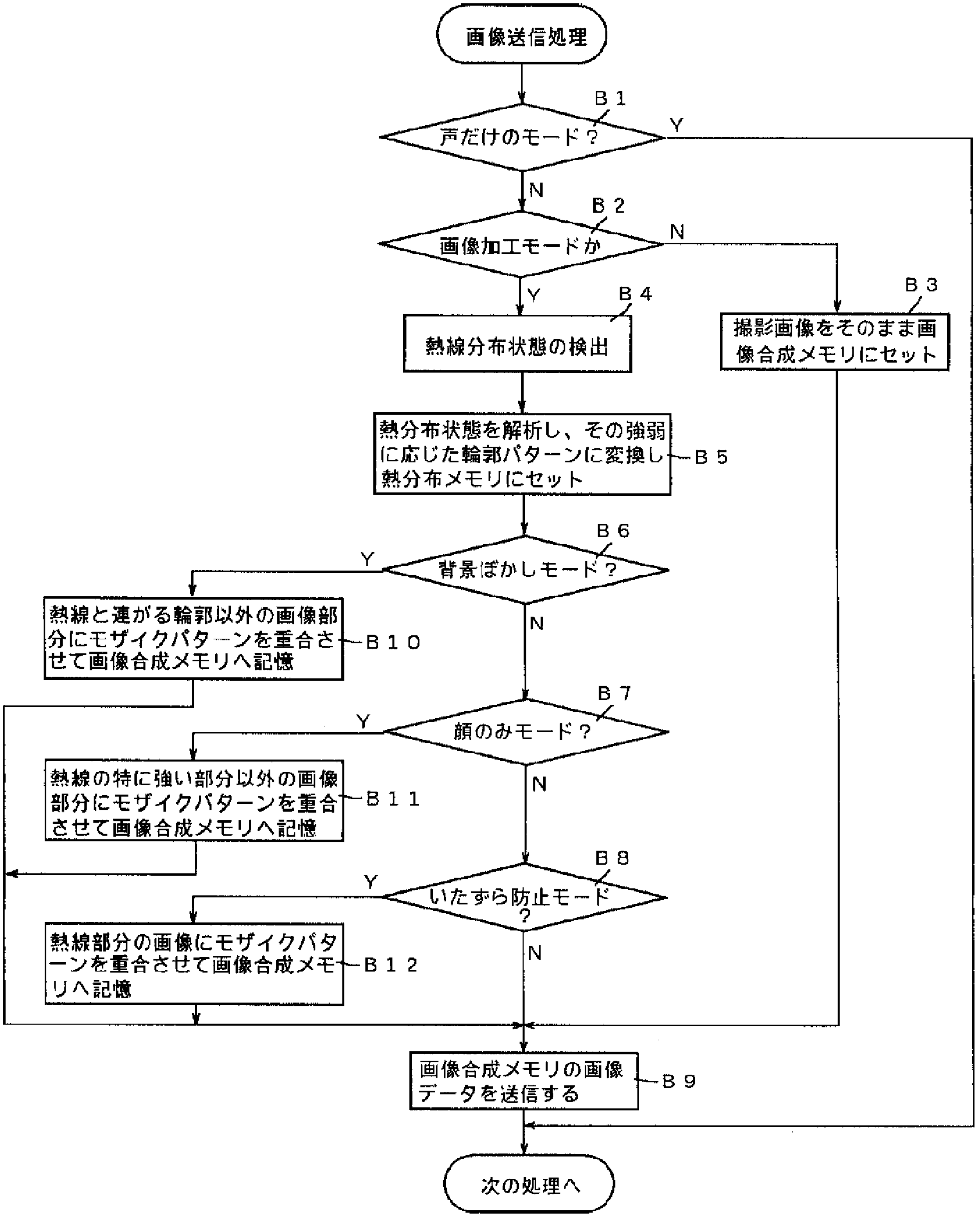
顔のみモード (B)

いたずら防止モード (C)

[Drawing 3]


音声の送信処理
A 1
いたずら防止モード？
N
Y
A 2
音声をそのまま送信
A 3
声選択は有？
N
Y
A 5
音声認識して音コードを得る
A 4
発信者の低音をカットして音声送信
A 6
音コードと対応する音声を発生して音声送信
次の処理へ

[Drawing 4]


画像送信処理
B 1
声だけのモード？
Y
N
B 2
画像加工モードか
N
Y
B 3
撮影画像をそのまま画像合成メモリにセット
B 4
熱線分布状態の検出
熱分布状態を解析し、その強弱に応じた輪郭パターンに変換し熱分布メモリにセット
B 5
B 6
背景ぼかしモード？
Y
熱線と連がる輪郭以外の画像部分にモザイクパターンを重合させて画像合成メモリへ記憶
B 1 0
N
B 7
顔のみモード？
Y
熱線の特に強い部分以外の画像部分にモザイクパターンを重合させて画像合成メモリへ記憶
B 1 1
N
B 8
いたずら防止モード？
Y
熱線部分の画像にモザイクパターンを重合させて画像合成メモリへ記憶
B 1 2
N
画像合成メモリの画像データを送信する
B 9
次の処理へ

[Translation done.]